

## CLAIMS

1. An annealed wafer obtained by performing heat treatment on a silicon wafer manufactured from a silicon single crystal grown by the Czochralski method, wherein a good chip yield of an oxide film dielectric breakdown characteristic in a region having at least a depth of up to 5  $\mu\text{m}$  from a wafer surface is 95% or more, and a density of oxide precipitates detectable in the wafer bulk and each having a size not smaller than a size showing a gettering capability is not less than  $1 \times 10^9/\text{cm}^3$ .
2. The annealed wafer according to claim 1, wherein the silicon wafer is manufactured from a silicon single crystal grown under a condition that, when growing the silicon single crystal, a wafer entire surface is an N region which is formed outside an OSF generated in the form of a ring in a thermal oxidation process, and is free from a defective region detectable by a Cu deposition method.
3. The annealed wafer according to claim 1 or 2, wherein the silicon wafer is manufactured from a silicon single crystal grown without adding nitrogen when growing the silicon single crystal.
4. A method for manufacturing an annealed wafer comprising the steps of: manufacturing a silicon wafer from a silicon single crystal obtained by growing the silicon single crystal under controlling a growth rate between a first growth rate at a boundary where a defective region left after annihilation of an OSF ring and detectable by a Cu deposition method is annihilated when the growth rate of pulling a silicon single crystal is gradually reduced, and a second growth rate at a boundary where an

interstitial dislocation loop is generated when the growth rate is further gradually reduced in case of growing the silicon single crystal by a Czochralski method; keeping the silicon wafer having grown-in precipitation nuclei formed in the step of growing the silicon single crystal at a temperature of  $T_4^{\circ}\text{C}$  in the range of  $500^{\circ}\text{C}$  to  $700^{\circ}\text{C}$  for a predetermined time  $t_1$ ; increasing the temperature of the silicon wafer to a temperature of  $T_5^{\circ}\text{C}$  in the range of  $1000^{\circ}\text{C}$  to  $1230^{\circ}\text{C}$  with a temperature increase rate of  $5^{\circ}\text{C}/\text{min}$  or less; and keeping the silicon wafer at the temperature of  $T_5^{\circ}\text{C}$  for a predetermined time  $t_2$ , whereby the grown-in precipitation nuclei are grown to oxide precipitates each having a size not smaller than a size having a gettering capability and oxygen in the vicinity of the silicon wafer surface is outdiffused.

5. The method for manufacturing an annealed wafer according to claim 4, wherein the keeping time  $t_1$  at the temperature of  $T_4^{\circ}\text{C}$  is 15 minutes or more.

6. The method for manufacturing an annealed wafer according to claim 4 or 5, wherein the keeping time  $t_2$  at the temperature of  $T_5^{\circ}\text{C}$  is 30 minutes or more.

7. A method for manufacturing an annealed wafer comprising the steps of: manufacturing a silicon wafer from a silicon single crystal obtained by growing the silicon single crystal under controlling a growth rate between a first growth rate at a boundary where a defective region left after annihilation of an OSF ring and detectable by a Cu deposition method is annihilated when the growth rate of pulling a silicon single crystal is gradually reduced, and a second growth rate at a boundary where an

interstitial dislocation loop is generated when the growth rate is further gradually reduced in case of growing the silicon single crystal by a Czochralski method; and heat treating the silicon wafer having grown-in precipitation nuclei formed in the step of growing the silicon single crystal to give a getting capability to the silicon wafer, wherein there are performed at least three steps including a temperature increase step  $A_1$  for growing the grown-in precipitation nuclei, a temperature increase step  $B_1$  for increasing a temperature to a higher keeping temperature, and a constant-temperature keeping step  $C_1$  for growing the grown-in precipitation nuclei to oxide precipitates each having a size not smaller than a size having a gettering capability and for outdiffusing oxygen in the vicinity of the silicon wafer surface.

8. The method for manufacturing an annealed wafer according to claim 7, wherein the temperature increase step  $A_1$ , the temperature increase step  $B_1$ , and the constant-temperature keeping step  $C_1$  are continuously performed.

9. The method for manufacturing an annealed wafer according to claim 7 or 8, wherein the temperature increase step  $A_1$  is for increasing a temperature from  $T_6^{\circ}\text{C}$  to  $T_7^{\circ}\text{C}$  at a rate of  $R_3^{\circ}\text{C}/\text{min}$ ,  $T_6^{\circ}\text{C}$  is  $700^{\circ}\text{C}$  or less,  $T_7^{\circ}\text{C}$  is in the range of  $800^{\circ}\text{C}$  to  $1000^{\circ}\text{C}$ , and  $R_3^{\circ}\text{C}/\text{min}$  is  $3^{\circ}\text{C}/\text{min}$  or less.

10. The method for manufacturing an annealed wafer according to any one of claims 7 to 9, wherein before increasing the temperature from  $T_6^{\circ}\text{C}$  to  $T_7^{\circ}\text{C}$  in the temperature increase step  $A_1$ , the temperature of  $T_6^{\circ}\text{C}$  is kept for 30 minutes or more.

11. The method for manufacturing an annealed wafer according to

claims 7 to 10, wherein the temperature increase step B<sub>1</sub> is for increasing the temperature from T<sub>7</sub>°C to T<sub>8</sub>C at a rate of R<sub>4</sub>°C/min, T<sub>7</sub>°C is in the range of 800°C to 1000°C, T<sub>8</sub>°C is in the range of 1050°C to 1230°C, and R<sub>4</sub>°C/min is 5°C/min or more.